

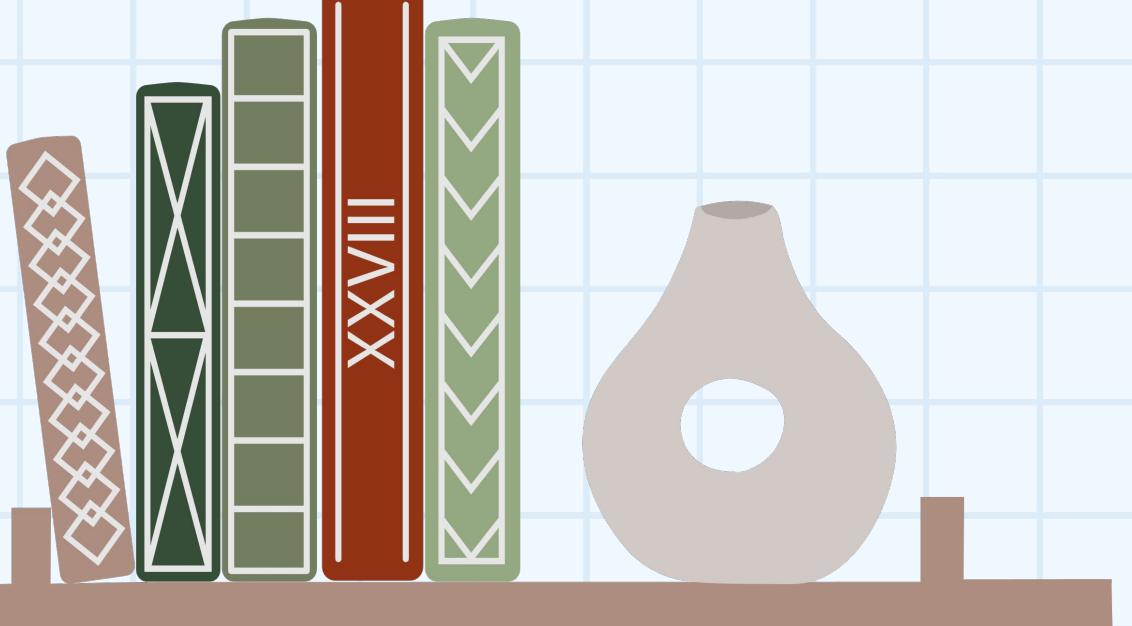
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# BS./BSC.IN

## Applied ai and Data Science

# Basics of Data Analytics



# Let's dive into and learn:



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1 Hierarchical Data

2 Long Data and Wide Data

# Hierarchical Data



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- So far, we have talked about data that exists in a somewhat simple manner.
- Most data in relational databases that you will encounter will have a hierarchical structure.
- Hierarchical data is data that has several hierarchies in it
- Tree-like structure
- Very common in relational databases

# Hierarchical Data



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## Examples:

- Continents (Asia)
  - Countries (India)
    - Cities (Delhi)
      - Localities (Vasant Kunj, Chanakyapuri)

# Hierarchical Data



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Example:

- Degree (BS)
- Semester (1<sup>st</sup>)
- Courses (Basics of Data Analytics)
  - Lecture (4<sup>th</sup>)

# Hierarchical Data

Purchase Date	Transaction ID	Product ID	Product Name	Amount
01-02-2025	53666	453	Banana	14
01-02-2025	53666	226	Grapes	29
01-02-2025	53667	984	Potato	22
01-02-2025	53668	453	Banana	14
01-02-2025	53668	226	Grapes	29
01-02-2025	53668	984	Potato	22
01-02-2025	53668	382	Watermelon	75
01-02-2025	53669	226	Grapes	29
01-02-2025	53670	984	Potato	22
02-02-2025	53701	382	Watermelon	75
02-02-2025	53701	984	Potato	22
02-02-2025	53701	453	Banana	14
02-02-2025	53702	984	Potato	22
02-02-2025	53703	453	Banana	14
02-02-2025	53703	382	Watermelon	75
03-02-2025	53704	226	Grapes	29

# Hierarchical Data

Purchase Date	Transaction ID	Product ID	Product Name	Amount
01-02-2025	53666	453	Banana	14
01-02-2025	53666	226	Grapes	29
01-02-2025	53667	984	Potato	22
01-02-2025	53668	453	Banana	14
01-02-2025	53668	226	Grapes	29
01-02-2025	53668	984	Potato	22
01-02-2025	53668	382	Watermelon	75
01-02-2025	53669	226	Grapes	29
01-02-2025	53670	984	Potato	22
02-02-2025	53701	382	Watermelon	75
02-02-2025	53701	984	Potato	22
02-02-2025	53701	453	Banana	14
02-02-2025	53702	984	Potato	22
02-02-2025	53703	453	Banana	14
02-02-2025	53703	382	Watermelon	75
03-02-2025	53704	226	Grapes	29

Purchase Date  
 Transaction  
 Product

# Hierarchical Data



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- Long Format
  - Multiple records for a given level
- Wide Format
  - Repeated records for a given records will be in be in a single row
- Which format to use depends on the task at hand
- Often need to convert the data between these two formats to do some task.

# Hierarchical Data - Long Format

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01-02-2025	53666	453	Banana	14
01-02-2025	53666	226	Grapes	29
01-02-2025	53667	984	Potato	22
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02-02-2025	53703	453	Banana	14
02-02-2025	53703	382	Watermelon	75
03-02-2025	53704	226	Grapes	29



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# Hierarchical Data - Wide Format

# Recap



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## Hierarchical Data

Long format vs Wide format



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# Thank you

